

Table of Contents

Table of Contents	1
Preface.....	5
101 - Terms, Format, and Definitions.....	5
<u>101.01 Meaning of Terms</u>	5
<u>101.03 Abbreviations</u>	5
<u>101.04 Definitions</u>	5
102 - Bid, Award, and Execution of Contract	8
<u>102 Bid, Award, and Execution of Contract</u>	8
103 - Scope of Work	8
<u>Deletions</u>	8
104 - Control of Work.....	8
<u>Deletions</u>	8
<u>104.06 Use of Roads by Contractor</u>	8
105 - Control of Material	8
105.02 Material Sources.	8
<u>105.02(a) Government-provided sources</u>	8
<u>105.05 Use of Material Found in the Work</u>	8
106 - Acceptance of Work	9
<u>106.01 Conformity with Contract Requirements</u>	9
<u>106.07 Delete</u>	11
107 - Legal Relations and Responsibility to the Public	11
<u>107.05 Responsibility for Damage Claims</u>	11
<u>107.06 Contractor's Responsibility for Work</u>	11
<u>107.09 Legal Relationship of the Parties</u>	11
<u>107.10 Environmental Protection</u>	11
108 - Prosecution and Progress	12
<u>108 Delete</u>	12
109 - Measurement and Payment.....	12
<u>109 Deletions</u>	12

<u>109.02 Measurement Terms and Definitions.</u>	12
152 - Construction Survey and Staking	13
<u>152.02 General.</u>	13
Table 152-1 Tolerances for reestablishing P-line, traverse, and elevations.	16
Table 152-2 Cross section and slope stake tolerances.	17
155 - Schedules for Construction Contracts	18
155 Delete.	18
157 - Soil Erosion Control	18
171 - Weed and Disease Prevention	19
201 - Clearing and Grubbing	20
<u>201.02 Material:</u>	20
<u>201.01 Description.</u>	20
<u>201.04 Clearing. (c)</u>	20
<u>201.06 Disposal.</u>	22
202 - Additional Clearing and Grubbing	22
<u>202.04 Selective Clearing.</u>	22
203 - Removal of Structures and Obstructions	22
<u>203.01 Description.</u>	22
<u>203.04 Removing Material.</u>	22
<u>203.05 Disposing of Material.</u>	22
204 - Excavation and Embankment	24
<u>204.06 Roadway Excavation.</u>	24
<u>R10 204.10 Embankment Construction.</u>	24
<u>204.11 Compaction.</u>	25
<u>204.13 Sloping, Shaping, and Finishing.</u>	25
<u>204.13 Sloping, Shaping, and Finishing.</u>	25
<u>Table 204-2 Construction tolerances.</u>	26
<u>204.14 Disposal of Unsuitable or Excess Material.</u>	26
<u>204.15 Acceptance.</u>	27
<u>Table 204-1 Sampling and Testing Requirements.</u>	27
205 - Rock Blasting	27

<u>205.03 Regulations</u>	27
<u>205.06 Preblast condition survey and vibration monitoring and control</u>	27
<u>205.07 Test Blasting</u>	28
<u>205.08 Blasting</u>	28
209 - Structure Excavation and Backfill	28
<u>209.10 Backfill</u>	28
<u>209.11 Compacting</u>	29
<u>Table 209-1 Sampling and Testing Requirements</u>	29
212 - Linear Grading	30
230 – Roadside Brushing	32
301 - Untreated Aggregate Courses	34
<u>301 Title Change</u>	34
<u>301.01 Work</u>	34
<u>301.02 Material</u>	35
<u>301.03 General</u>	35
<u>301.04 Mixing and Spreading</u>	35
<u>301.05 Compacting</u>	36
<u>301.06 Surface Tolerance</u>	36
<u>301.08(b) Plasticity Index</u>	37
<u>Table 301-1—Acceptance Sampling and Testing Requirements</u>	38
<u>301.08 (b)</u>	39
<u>301.09 Measurement</u>	39
303 - Road Reconditioning	39
<u>303.01 Work</u>	39
<u>303.10 Measurement</u>	39
<u>303.10 Measurement</u>	40
557 - Timber Structures	42
571 - Prefabricated Bridges	44
<u>571.12</u>	48
<u>571.13</u>	48
572 - Log Stringer Bridges	50

584 - Log Structures.....	52
602 - Culverts and Drains	54
<u>602.03 General</u>	54
625 - Turf Establishment	54
<u>625.03 General</u>	54
<u>625.04 Preparing Seedbed</u>	56
<u>625.11 Measurement</u>	56
651 - Development of Pits & Quarries	56
703 - Aggregate.....	57
<u>703.05 Subbase, Base, Surface Course, and Screened Aggregate</u>	57
<u>703.10(e) Flakiness Index</u>	61
<u>703.10(i) Adherent Coating</u>	61
718 - Traffic Signing and Marking Material.....	61
<u>718.05 Aluminum Panels</u>	61

PREFACE

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

101 - TERMS, FORMAT, AND DEFINITIONS

101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

Contractor--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the “purchaser”.

Culvert--No definition.

Right-of-Way--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

Adjustment in Contract Price--“Equitable adjustment,” as used in the Federal Acquisition Regulations, or “construction cost adjustment,” as used in the Timber Sale Contract, as applicable.

Change--“Change” means “change order” as used in the Federal Acquisition Regulations, or “design change” as used in the Timber Sale Contract.

Design Quantity--“Design quantity” is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges*. Under these FP specifications this term is replaced by the term “Contract Quantities”.

Forest Service--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line--A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road--Temporary construction access built along the route of the project.

Purchaser--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Protected Streamcourse--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

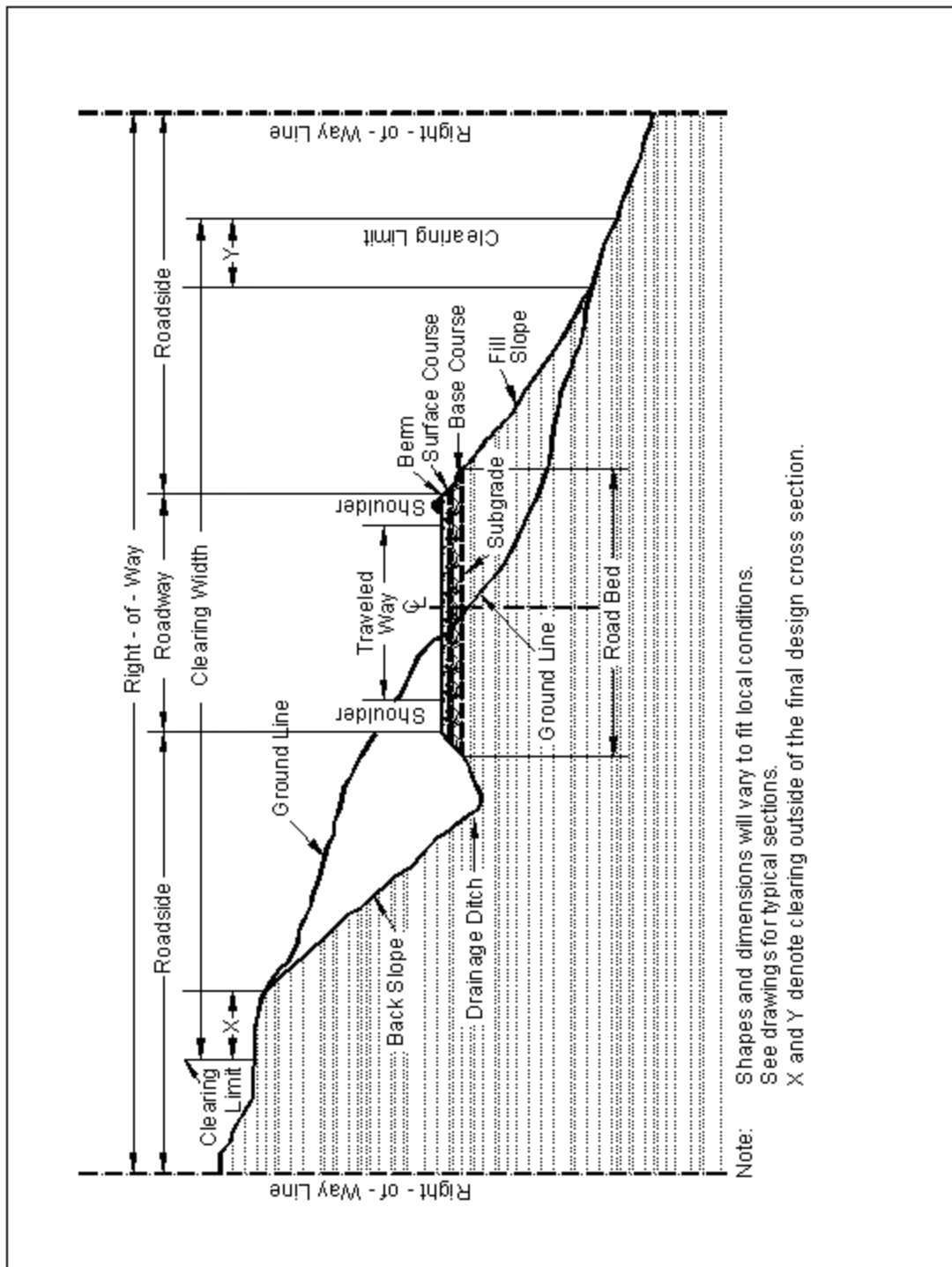
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



102 - BID, AWARD, AND EXECUTION OF CONTRACT

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - SCOPE OF WORK

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - CONTROL OF WORK

Deletions

Delete Sections 104.01, 104.02, and 104.04.

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

105 - CONTROL OF MATERIAL

105.02 Material Sources.

105.02(a) Government-provided sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

106 - ACCEPTANCE OF WORK

106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

Follow the requirements of FAR Clause 52.246-12 Inspection of Construction.

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer's recommendations or to these specifications, whichever is more strict.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor's results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove and replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted, at no cost to the Government.

(a) Disputing Government test results. **If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:**

- (1) Sampling method;
- (2) Number of samples;
- (3) Sample transport;
- (4) Test procedures;
- (5) Testing laboratories;
- (6) Reporting;
- (7) Estimated time and costs; and
- (8) Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

(b) Alternatives to removing and replacing non-conforming work. As an alternative to removal and replacement, the Contractor may submit a written request to:

- (1) Have the work accepted at a reduced price; or
- (2) Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.

106.07 Delete

Delete subsection 106.07.

107 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10 Environmental Protection.

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

108 - PROSECUTION AND PROGRESS

108 Delete.

Delete Section 108 in its entirety.

109 - MEASUREMENT AND PAYMENT

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.

109.07 Eliminated Work.

109.08 Progress Payments.

109.09 Final Payment.

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

“(b) Cubic yard” to “(c) Cubic yard”.

Add the following definition:

(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

152 - CONSTRUCTION SURVEY AND STAKING

Description

152.01

Delete second sentence.

152.01(c) Material.

Add the following:

Use required stake dimensions and materials. Pre-paint the top 2 inches of all stakes and lath, or mark them with plastic flagging. Use designated colors for paint or flagging. Mark all stakes with a stake pencil that leaves a legible imprint, or with waterproof ink.

Do not use aerosol spray paints.

Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence.

Construction Requirements

152.02 General.

Delete first sentence and replace with the following:

Include staking activities in construction schedule.

Delete the last sentence in the first paragraph and replace with the following:

Data relating to horizontal and vertical alignment , theoretical slope stake catch points and other design data will be furnished upon acceptance of final design.

Add the following:

When indicated on the plans, a preliminary survey line has been established on the ground. The project location line is established by offsets from this preliminary line.

Delete second sentence in second paragraph and replace with the following:

Reestablish missing reference, control lines, or stakes as necessary to control subsequent construction staking operations

152.03 Survey and Staking Requirements.

(b) Roadway cross-sections.

Replace the first two sentences with the following:

Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater than 200 feet take cross-sections at a maximum centerline spacing of 50 feet.

c) Slope Stakes & References:

Replace section with the following:

Slope stakes and references. When required, locate slope stakes on designated portions of the road. Locate the slope stake catch points and use them to establish clearing limits and slope stake references.

Mark slope stakes with the station, the amount of cut or fill, the horizontal distance to centerline, and the slope ratios.

Place slope reference stakes at least 10 feet outside the clearing limit and mark with the offset distance to the slope stake. Place sight stakes when required.

Prior to clearing and grubbing operations, move the slope stake outside the clearing limit to the slope reference stake. After clearing and grubbing and before excavation, reset the slope stakes in their original position.

Use the designated method to establish the slope stake catchpoint.

- **Method I**—Computed Method. Use the template information shown in the plans or other Government-provided data to calculate the actual location of the catchpoint. The slope stake “catchpoint distance” provided may be used as a trial location to initiate slope staking. Recatch slope stakes on any section that does not match the staking report within the tolerances established in Table 152-2.
- **Method II**—Catchpoint Measurement Method. Determine the location of slope stake catchpoints by measuring the catchpoint distances shown in the plans or other Government-provided data.

(d) Clearing and grubbing limits.

Add the following:

Establish clearing limits on each side of the location line by measuring the required horizontal or slope distances shown in the stake notes. Mark the clearing limits with flagging or tags on trees to be left standing, or on lath. Make markings intervisible, and no more than 90 feet apart.

After establishing clearing limits, move the location line stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line

(e) Centerline reestablishment.

Replace with the following:

Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 feet when the centerline curve radius is less than or equal to 200 feet. When the centerline curve radius is greater than 200 feet, the maximum distance between centerline points is 80 feet. Bypass no centerline points falling within any portion of a curve.

(g) Culverts.

Replace subsection with the following:

Set culvert reference stakes at all culvert locations. Set a culvert reference stake on the centerline of the culvert 10 feet from inlet end or beyond the clearing limit, whichever is greater. Record the following on culvert reference stakes:

- (1) Diameter, actual field measured length, and type of culvert.
- (2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.
- (3) Station of actual point where culvert intersects centerline.

When required, stake headwall for culverts by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. Perform this work after clearing is completed.

152.03 (j) Borrow and waste areas

Delete the last sentence.

152.03 (l) Miscellaneous Survey and Staking.

Add the following:

- (11) Cattleguards
- (12) Drain Dips
- (13) Erosion Control Measures

Replace Table 152-1 with the following two tables:

Table 152-1 Tolerances for reestablishing P-line, traverse, and elevations.

Precision Class	Minimum Position Closure	Angular Accuracy (±)	L-Line Tangent Control Points^a (±)	Vertical Closure^b (±)
A (Bridges)	1/10,000	2 sets, direct/reverse 10 second rejection limit	N/A	0.02 ft or 0.02ft/1000ft ^c
B	1/5,000	2 sets, direct/reverse 20 second rejection limit	0.1 ft	0.02 ft or 0.02ft/1000ft ^c
C	1/1,000	1 set, direct/reverse 1 minute rejection limit	0.2 ft	0.5ft/1000ft ^c
D	1/300	Foresight and backsight; 15 minute rejection limit ^c	0.4 ft	1.0ft/1000ft ^c
E	1/100	Foresight and backsight; 30 minute rejection limit ^c	0.8 ft	1.0ft/1000ft ^c
<p>a. Accuracy of offset measurement.</p> <p>b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.</p> <p>c. Use greater value.</p>				

Table 152-2 Cross section and slope stake tolerances.

Item	Tolerances				
	A	B	C	D	E
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	(±)2°	(±)3°	(±)3°	(±)5°	(±)5°
Take cross-sections topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed	0.5 ft	1.0 ft	2.0 ft	2.0 ft	3.0 ft
Horizontal and vertical accuracy for cross-sections, in feet or percentage of horizontal distance measured from traverse line, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%	0.2 ft or 1.0%	0.3 ft or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater.					
Slope reference stakes and slope stakes.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%	0.2 ft or 1.0%	0.3 ft or 1.0%
Clearing limits	1.0 ft	1.0 ft	1.0 ft	1.5 ft	2.5 ft

155 - SCHEDULES FOR CONSTRUCTION CONTRACTS

155 Delete.

Delete Section 155 in its entirety.

157 - SOIL EROSION CONTROL

157.02 Materials

Add the following:

Provide bales, wattles, logs and rolls from a certified noxious weed free source.

157.03 General.

Delete the first two paragraphs and replace with the following:

Submit an Erosion Control Plan detailing permanent and temporary control measures to minimize erosion and sedimentation during and after construction in accordance with the plans and storm water permits. Do not modify the type, size, or location of any control or practice without approval. Submit the erosion control plan proposal at least 7 days before operations begin to the CO for approval.

Reflect in the Erosion Control Plan special concerns and measures necessary to protect resources and government improvements. Include:

- (a) The construction activities and sequence of implementation relating to specific erosion control measures.
- (b) The location and type of permanent controls to be implemented during construction. Examples include but are not limited to settling pools, application and timing of seed and fertilizer, use of wattle and coir logs, and construction of ditch flow cross drains in proximity to flowing streams.
- (c) The location and type of temporary controls to be implemented during construction.
- (d) For work in stream channels describe level of ground and vegetative disturbance and measures to reduce potential sediment delivery.

Add the following to the third paragraph:

Upon completion of construction at the site, remove all temporary erosion control devices, dewatering materials and equipment from Government property.

157.09 Diversions.

Delete the 1st sentence and add the following:

When shown on the drawings construct temporary channels, temporary culverts, or sandbags to divert water around disturbed areas and slopes. Earthen dams are prohibited.

Add the following to the second sentence.

When shown on the drawings ,

171 - WEED AND DISEASE PREVENTION

Weed Prevention

Description

171.01 This work consists of washing and treating construction equipment and brushers to remove soil, seeds, plants, and plant fragments from the equipment before the equipment is used on National Forest System lands. Clean air filters of all plant matter and seeds.

Material

171.02 Conform to the following Subsection:

Water	725.01
-------	--------

Construction Requirements

171.03 General . Notify the CO in writing at least 15 days before moving any construction equipment onto National Forest System lands. Construction equipment includes pickup trucks, shop trucks, and others operating on native soil subgrades and **does not** include passenger cars, or other vehicles that regularly travel roads between the construction site and areas outside of National Forest System lands.

Perform all work at a location designated on the plans or other locations approved in writing. Provide the CO with 2 day opportunity to inspect the washed equipment. The Contractor may certify equipment cleaning if CO inspection is impractical.

171.04 Equipment. Use a high pressure washing system.

For work on National Forest System lands, use a washing system that traps all soil, seeds, and plant material for removal from National Forest System lands or recycles the water for continued use. If the equipment recycles the water, provide adequate filters for seed removal. Dispose of the filter material and removed seeds in an approved manner. Do not mix soaps, detergents, or other chemicals with the wash water.

For work at a commercial washing facility, use approved facilities.

171.05 Washing. Wash the sides, tops, beds, and undercarriages of all construction equipment. Remove all soil, seeds, plants, plant fragments, dirt, and debris from the construction equipment, including engine air cleaners.

171.06 Inspection. Inspect the washed construction equipment, including the undercarriage, to ensure that the washing removed the dirt, debris, and seeds from the construction equipment. Rewash the construction equipment as necessary or as directed.

171.07 Acceptance. Weed prevention will be evaluated under Subsection 106.02.

Measurement

171.08 Do not measure weed prevention for payment.

Payment

171.09 Include all costs associated with the Section 171-Weed Prevention in the unit price for Section 151-Mobilization.

201 - CLEARING AND GRUBBING

201.02 Material:

Delete Tree wound dressing material reference.

201.03 General.

Delete the last sentence.

201.04 Clearing.

Delete the last sentence of (d).

201.01 Description

Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

(c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

Construction Requirements

201.04 Clearing.

Add the following:

Utilization standards for merchantable timber are listed below. Fall and buck merchantable material into lengths not to exceed ___40___ feet. Pieces (logs) meet utilization standards when such pieces would have met Utilization Standards if bucking lengths were varied to include such material.

Minimum Utilization Standards

Length	Diameter (Inside Bark) at Small End	33-1/3 Net Scale in % Gross for Sawlog
12 feet	_____6_____ inches	50% Net Scale in % Gross for Utility

201.05 (b)

Delete entire paragraph and replace with the following:

Grub all embankment areas. Undisturbed stumps may be left in place if they protrude less than 6 inches above the original ground and will be covered with more than 2 feet of embankment.

201.06 Disposal.

Delete the first sentence of this subsection and substitute the following:

All merchantable timber within the clearing limits on either private or Government land remains the property of the landowners. Deck according to 201.04(f) on each owner's property adjacent to the road in approved locations.

202 - ADDITIONAL CLEARING AND GRUBBING

202.04 Selective Clearing.

Add the following:

Dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed are designated for cutting.

When marked in advance, remove hazard trees or unstable live trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

203 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.04 Removing Material.

Replace the fourth and fifth paragraphs with the following:

Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below subgrade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05 Disposing of Material.

Add the following:

(e) Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(f) Scattering. Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.

(g) Chipping or Grinding. Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(h) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

(i) Decking Firewood Material. Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil.

(j) Removal to designated locations. Remove construction slash to designated locations.

(k) Piling. Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet.

(l) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

(m) Hydrological Sensitive Placement. Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:

1. Place windrow segments on contours, wrap in type I geotextile.
2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

204 - EXCAVATION AND EMBANKMENT

204.05 Conserved Topsoil

Delete the entire paragraph.

204.06 Roadway Excavation

(a) General.

Add the following:

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

204.06 Roadway Excavation.

Add the following:

Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated in the roadway unless specifically included in the slash treatment method.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into the embankment. Do not place snow or ice in a manner to cause damage.

During pioneering operations prevent undercutting of final excavation slopes.

R10 204.10 Embankment Construction.

Add the following:

Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline.

(a) General.

Delete the third paragraph and add the following:

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes using one of the following methods:

Compact slopes as construction of the embankment progresses by layer placement.

Walking embankment side slopes with a dozer.

Overbuild the fill and operating spreading equipment and **loaded** hauling equipment over the entire surface of embankment and either remove excess material to the final slope line or leave in place at no cost with written permission of CO.

204.11 Compaction.

Delete the first paragraph and replace it with the following:

For compaction according to method (a), (b), or (c), use AASHTO T 27 to determine the amount of material retained on a Number. 4 sieve. For compaction methods (d) or (e) no sieve test is required.

Add the following compaction methods:

(d) Layer Placement Method (Hauling and Spreading Equipment). Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

(e) Layer Placement (Roller Compaction) Method. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until visible deformation of the layer ceases or, when a sheep's foot roller is used, the roller "walks out" of the layer. Make at least three complete passes.

204.13 Sloping, Shaping, and Finishing.

(a) Sloping.

Add the following:

Slope rounding is not required on tolerance class D through M roads.

204.13 Sloping, Shaping, and Finishing.

Delete section (d) and add the following:

(d) Finishing. For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed. For all roads, finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2.

Ensure that the subgrade for both surfaced and un-surfaced roads is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For un-surfaced roads, use one of the following methods to finish the roadbed:

- (1) Method A. Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.
- (2) Method B. Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until visible displacement ceases.
- (3) Method C. For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

Add Table 204-2—Construction Tolerances:

Table 204-2 Construction tolerances.

	Tolerance Class ^(a)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	+0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope ^(b))	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

a. Maximum allowable deviation from construction stakes and drawings.

b. Maximum allowable deviation from staked slope measured from slope stakes or hinge points.

c. Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

204.14 Disposal of Unsuitable or Excess Material.

Delete the text of the first paragraph and substitute the following:

Dispose of unsuitable or excess material at designated sites or legally off of the project.

Add the following:

End haul consists of the direct loading, hauling, and placement of excess or unsuitable excavation including clearing and grubbing debris from within areas shown on drawings to designated disposal location(s). End Haul also includes all work required to prepare designated disposal location(s) prior to placement of end hauled material. Shape and dress slopes of disposed material as shown on drawings or as approved by CO.

204.15 Acceptance

Table 204-1 Sampling and Testing Requirements.

Add the following note to the table:

(2) When compaction methods (d) or (e) are used AASHTO M 145, T 99, T 180, and T 310 are not required for earth embankment test methods.

204.16 (b) Unclassified borrow, select borrow, and select topping.

Add the following:

When contract quantities are designated in the schedule as method of measurement estimate the borrow excavation quantity from design data based on prism cubic yard compacted in final position, in the embankment.

The quantity of material hauled will be based on the quantity of borrow excavation shown in the schedule. Measure haul distance between the center of the material source and the center of embanked material. Compute haul by analytical methods as determined by CO.

Haul from non-designated material source requested by the Contractor will be considered haul from Contractor-furnished sources with an adjustment in contract price, in accordance with applicable contract provisions.

Haul distance from a Contractor-furnished source will be measured as the haul distance from the designated material source if the haul distance from the Contractor-furnished material source is greater than the haul distance from the designated source.

Haul distance from a Contractor furnished-sources will be measured as the haul distance from the Contractor-furnished material source if the haul distance from the Contractor-furnished source is less than the haul distance from the designated source.

205 - ROCK BLASTING

205.03 Regulations

Add the following:

(e) Forest Service Manual (FSM) 6745 Explosives and Blasting Materials.

205.06 Preblast condition survey and vibration monitoring and control.

Add the following:

Limit blasting induced vibrations in saturated soils or on steep slopes as designated or as directed by the CO.

Notify the owners of nearby utilities at least 24 hours before blasting.

205.07 Test Blasting.

Add the following:

Test blast at all new sources, when rock type changes, and when blast layout changes due to slope or other changes.

205.08 Blasting.

Delete the following:

Place a stake next to each hole with hole number and total depth drilled.

Do not stem the hole with drill cuttings.

Add the following:

(8) Halt blasting operations when any of the following conditions exist:

Precipitation exceeds 1 inch in any 24 hour period.

Precipitation exceeds 3 inches in any 96 hour period.

Precipitation exceeds 4 inches in any 144 hour period.

A landslide occurs within 300 feet of a blast site under any precipitation conditions.

209 - STRUCTURE EXCAVATION AND BACKFILL

209.10 Backfill.

(a) General.

Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at subgrade centerline.
- Installation in a protected stream course.

- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

Excavate an area on each side of the pipe as needed to effectively achieve compaction requirements. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11 Compacting.

Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

Table 209-1 Sampling and Testing Requirements

Add the following:

(2) Compaction methods (A) and (B) do not require AASHTO T-99 or T-310 test methods for foundation fill.

212 - LINEAR GRADING

Linear Grading

Delete the entire specification and replace it with the following:

Description

212.01 This work consists of reference staking drainage structures and control points, marking clearing limits outside units, clearing and grubbing, slash treatment, excavation and embankment, including haul and end haul, erosion control, material source development, turf establishment, to construct roadways and associated features within the specified alignment and grade tolerances.

Stake according to sections 152 and FSS 152.

Develop material sources according to section(s) 105, FSS 651, and the approved plan of operations for Pit Development.

Construction Requirements

212.02 Clearing & Disposal. Protect construction stakes and construction control markers. Remove or treat all trees, snags, downed timber, brush, and stumps within the clearing limits. Do not damage vegetation not designated for treatment.

Immediately remove slash deposited in stream courses.

Fell all dead trees that are outside the clearing limits and that lean toward the road and are tall enough to reach the roadbed.

Leave stumps outside grubbing limits with heights less than 12 inches or one-third of the stump diameter; whichever is greater, measured on the side adjacent to the highest ground. Leave felled trees outside the clearing limits in place, and treat them no further unless otherwise designated.

Utilization standards for merchantable timber are listed below. Fall and buck merchantable material into lengths not to exceed ____ 40 ____ feet. Pieces (logs) will be considered as meeting utilization standards when such pieces would have met Utilization Standards if bucking lengths were varied to include such material.

Minimum Utilization Standards

12 feet in Length

6 inches in Diameter (Inside Bark) at Small End

33-1/3 Net Scale in % of Gross for Saw log 50% Net Scale in % Gross for Utility

Do not cut vegetation less than 3 feet in height and less than 3 inches in diameter that is within the clearing limits but beyond the roadway and not in a decking area and that does not interfere with sight distance along the road.

Merchantable Timber

Deck according to 201.04(f)

Unmerchantable Timber and Large Construction Slash

Method h with slash excess to subgrade handled by method e

212.03 Pioneering. Do not undercut the final back slope during pioneering operations. Deposit material inside the roadbed limits or designated locations. Do not restrict drainage.

212.04 Grubbing. Within the **roadway** limits remove stumps with less than **24** inches of cover.

212.05 Roadway Excavation & Embankment. Construct the roadbeds according to the applicable requirements of Section 204 except as modified herein. Construct the roadway to the required template. Protect backslopes from being undercut. Deposit material inside the roadbed limits or designated locations. Do not restrict drainage.

Blast rock according to Section 205 and FSS 205.06 and 205.08 Rock Blasting.

Areas requiring end haul and end haul disposal areas will be identified on ground and approved in advance and will be done according to FSS R10 204.14.

Place rocks that are too large to be incorporated in the embankment outside the traveled way on the downhill side so that they will not roll, obstruct drainage, or hinder roadbed use and maintenance. Maximum particle cannot exceed half the depth of embankment layer.

Place material by side casting and end dumping to a minimum depth needed for operation of spreading and hauling equipment and minimum depths as shown on typical cross- sections. Minimum embankment depth in areas where prepared ground surfaces are solid rock is 12 inches. Construct solid embankments with adequate compaction by working smaller rock and fines in with larger rocks to fill the voids.

Produce and use borrow material from **approved sources**, and remove and treat unsuitable or excess material.

Operate loaded hauling and spreading equipment uniformly over full width of each layer.

Leave slopes that are to be seeded in a roughened condition.

Use a crawler tractor with a dozer blade to shape and finish the roadbed. Provide for drainage of surface water, unless otherwise designated. Do not permit individual rocks in the roadbed to protrude more than 4 inches above the subgrade. A motor grader finish is not required.

Do not encroach on stream channels, wetlands, or extend beyond right-of-way or easement limits. Do not make alignment or profile grade adjustments that adversely affect drainage. Construct the roadbed within the following grading tolerances:

(a) Alignment (centerline). Alignment may be shifted a maximum of 20 feet slope distance left or right of the planned centerline. Proposed realignments greater than 20' slope distance must be approved in writing prior to start of construction. Do not construct curves with radii less than 80 feet. Compound curves are permitted. Traveled way tolerance is (+) 2 feet unless otherwise designated.

(b) Profile grade. Profile grade may be shifted a maximum of 5 feet up or down from the plan elevation provided the new grade tangent does not vary more than 2 percent from the plan grade tangent. Connect revised forward and back grade tangents with a uniform vertical curve consistent with the criteria.

212.06 Drainage. Install culverts and other drainage structures according to Section 602, 571, 572 and Section 209.

212.07 Erosion Control. Install erosion control measures and seeding according to the drawings and Sections 157 and 625.

212.08 Acceptance. Linear grading will be evaluated under Subsections 106.02 and 106.04.

Clearing and slash and timber treatment will be evaluated under Sections 201 and 203.

Measurement

212.09 Measure the Section 212 items listed in the bid schedule according to Subsection 109.02 and the following.

Do not measure changes in the clearing and grubbing quantity caused by alignment adjustments under Subsection 212.04.

Payment

212.10 The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 212 pay item listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

230 – ROADSIDE BRUSHING

842.01

Service Required

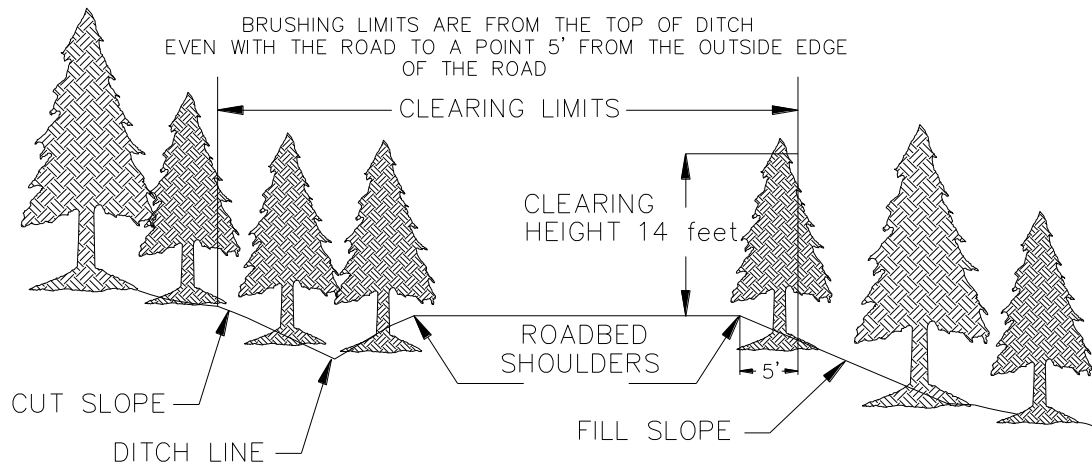
Cut vegetation on cutslopes, in ditches, and on roadsides.

842.02

Performance Standard

Roadway vegetation maintenance is complete when the vegetation has been removed in accordance with the diagrams and specifications herein, and has been accepted by the COR.

Clearing Limits are from the edge of the road to a point on the cut slope even with the top of road.
(See diagram below)



General Notes

1. Cut all brush within treatment area which is less than or equal to 8 inches in diameter measured 6 inches above ground.
2. Cut brush to provide overhead clearance of 14 feet on road surface.
3. Remove debris from road surface, ditches, and cut slope above road. Scatter to fill slopes below road, no debris piles allowed at culvert outlets.
4. Clear ditches of woody debris. Clean culvert inlets and outlets of debris a minimum of 5' from culvert inlet.

842.03 Location of Work

As specified on roads listed on the ROAD LISTING, SHOWN ON THE PLANS, or as ordered by the COR.

842.04 Measurement

Measurement under this Section will be made by the total number of units for each item listed in the SCHEDULE OF ITEMS completed and accepted.

A. Mile: Work activity will be measured along the centerline of the road regardless of the number of lanes, each mile of roadway will include treatment on both sides of the road.

B. Visual: Basis for Acceptance

842.05 Payment

A. The accepted quantities will be paid at the contract price per unit of measurement for the Section 842 pay items listed in the schedule of items. Payment will be full compensation for the work prescribed in this Section.

Pay Item

Pay Unit

23051 Brushing,

Mile

301 - UNTREATED AGGREGATE COURSES

301 Title Change.

Change the title to: **Section 301 Aggregate Courses**

301.01 Work.

Add the following:

Work includes producing aggregate by pit-run, grid rolling, screening, or crushing methods, or placing Government-furnished aggregate. Work may include additive mineral filler, or binder.

301.02 Material.

Add the following:

Bentonite	725.30
Calcium Chloride Flake	725.02
Lignon Sulfonate	725.20
Magnesium Chloride Brine or Calcium Chloride Liquid	725.02

301.03 General.

Add the following:

Written approval of the roadbed is required before placing aggregate.

For pit run or grid-rolled material, furnish material smaller than the maximum size. No gradation other than maximum size will be required for pit-run or grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size. After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

Provide additives or binder, if required, at the proportions specified.

Develop and use Government furnished sources according to Section 105.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at locations approved. Clear and grub stockpile sites according to Section 201.

301.04 Mixing and Spreading.

Delete the first sentence of the first paragraph and add the following:

Ensure that aggregate and any required additives, water, mineral filler, and binder are mixed by the specified method except, if crushed aggregate products are being produced and mineral filler, binder, or additives are required, uniformly blend following crushing. Control additive proportions to 0.5 percent dry weight.

(a) Stationary Plant Method. Mix the aggregate with other required materials in an approved mixer. Add water during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified density. After mixing, transport the aggregate to the jobsite while it contains the proper moisture content, and place it on the roadbed or base course using an aggregate spreader.

(b) Travel Plant Method. After placing the aggregate for each layer with an aggregate spreader or windrow-sizing device, uniformly mix it with other required materials using a traveling mixing plant. During mixing, add water to provide the necessary moisture content for compacting.

(c) Road Mix Method. After placing the aggregate for each layer, mix it with other required materials at the required moisture content until the mixture is uniform throughout. Mix aggregate, water, and all other materials until a uniform distribution is obtained.

Spread the aggregate in a uniform layer, with no segregation of size, and to a loose depth that will provide the required compacted thickness.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

Route and distribute hauling and leveling equipment over the width and length of each layer.

301.05 Compacting

Delete and replace with the following:

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

Compaction A. Operating spreading and hauling equipment over the full width of the travel way.

Compaction B. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction C. Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction D. Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Compaction E. Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

Compaction F. Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

Compaction G. Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

301.06 Surface Tolerance.

Add the following:

Thickness and Width requirements:

The maximum variation from the compacted specified thickness is $\frac{1}{2}$ inch. The compacted thickness is not consistently above or below the specified thickness and the average thickness of 4 random measurements for any $\frac{1}{2}$ mile of road segment is within $+\frac{1}{4}$ inch of the specified thickness.

The maximum variation from the specified width will not exceed +12 inches at any point. The compacted width is not consistently above the specified width and the average of any four random measurements along any $\frac{1}{2}$ mile of road segment is within +4 inches of the specified width.

301.08(b) Plasticity Index.

Add the following to the first sentence:

“and under 703.05(c)(1)”.

Table 301-1: Add the following:**Table 301-1—Acceptance Sampling and Testing Requirements.**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Subbase & Base Courses L, M, N, O, P, Q, R	Measured and tested conformance (Subsection 106.04)	Plastic Limit	-	AASHTO T 90	1 per each 1,000 T	From the windrow or roadbed after processing	Yes	4 Hours

Table 301-1—Acceptance Sampling and Testing Requirements.

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate Width	Measured and tested conformance (Subsection 106.04)	Width	-	-	4 per each 0.5 mi	Roadbed after processing	-	4 Hours
Aggregate Thickness	Measured and tested conformance (Subsection 106.04)	Thickness	-	-	4 per each 0.5 mi	Roadbed after processing	-	4 Hours
Additive	Measured and tested conformance (Subsection 106.04)	Amount of Additive	-		1 per each 1,000 T	From the windrow or roadbed after processing	No	4 Hours

301.08 (b)

Delete 301.08 (b)

301.09 Measurement.

Replace the second paragraph with the following:

Measure aggregate by cubic yard compacted in place when payment is by contract quantities.

301.10 Payment

Delete the following:

adjusted according to Subsection 106.05

303 - ROAD RECONDITIONING**303.01 Work.**

Delete and add the following:

This work consists of reconditioning ditches, shoulders, roadbeds, cattleguards, asphalt surfaces, and aggregate surfaces.

303.05 Road Reconditioning

Delete the 4th sentence and replace with:

Remove surface irregularities, and shape to provide a uniform surface.

303.10 Measurement

Modify the third paragraph as follows:

Measure road reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, station, foot, or square yard. Measure horizontally along centerline of roadway. Measure the square yard area on horizontal plane. Do not measure isolated areas less than 20 square yards.

303.10 Measurement

Modify the second paragraph as follows:

Measure ditch reconditioning and shoulder reconditioning by the mile, station, or foot horizontally along the centerline of the roadway for each side of the roadway.

30311(01) - BLADING

811.01 Description:

This work shall consist of blading the surface of an existing road to remove potholes and wash boarding, and re-establish an adequate crown.

811.02 Construction Requirements:

Equipment The contractor's equipment must be a motor grader of adequate size and quality, equivalent to a Cat 12, and be properly maintained to perform the requirements of this specification. Worn cutting edges and uneven tire pressure are not acceptable. Contractors are encouraged to use a cab-mounted slopometer to establish required crowns.

Cutting The entire road surface, edge to edge, shall be cut in second gear to sufficient depth in order to remove all potholes and washboards. A minimum of four cutting passes are required, two in each lane. Cut material shall be windrowed to the center of the roadway.

Lay back The lay back operation shall be performed in first gear. Windrowed material shall be spread uniformly across both sides to provide a normal 3% centerline crown. Windrowed material shall not be bladed over the road shoulder into the ditch.

Shape The final road shape shall have a well-defined centerline located in the middle of the road. The roadway edges shall be parallel with equal width sides. Leaving edge windrows or working berms are not acceptable.

Width of Blading No surface material shall be bladed beyond the road shoulder.

Rocks No rocks over 6" in diameter will be left on the road after blading.

Working Berms All working berms shall be laid back before quitting for the day.

Intersections Intersections of all open roads shall be bladed a distance of 50' from the center of the main road up the side road.

Backslopes Backslopes shall not be undercut.

Bridges Do not deposit material from blading onto bridges.

Turnouts Blade all turnouts and turnarounds full width.

Organic Material Any blown down, alder, or organic detritus left on the road after blading shall be removed by hand if necessary.

811.03 Compaction

Roads requiring compaction shall be included in the roads listing.

Compaction Method A: Breaking track while operating equipment on the traveled way.

Compaction Method B. A 7-10 ton pneumatic, steel, or equivalent vibratory roller, operated to cover the full width two times.

811.04 Method of Measurement:

Blading will be measured by the mile and shall include as many passes as are necessary to provide a smooth, properly shaped road surface. Acceptance will be based on visual inspection.

811.05 Basis of Payment:

The accepted quantities of blading will be paid for at the contract unit price per mile, or fraction thereof, completed and accepted by the engineer.

Payment will be made under:

<u>Pay Item No.</u>	<u>Pay Item</u>	<u>Pay</u>
30311(01)A	Blading Compaction A	Mile
30311(01)B	Blading Compaction B	Mile

557 - TIMBER STRUCTURES

557.04 Treated Timber.

Replace the first sentence of the third paragraph with the following:

Use a copper naphthenate solution containing a minimum of 2 percent copper metal for field treatments of material originally treated with copper naphthenate, pentachlorophenol, creosote, creosote solution, or waterborne preservatives, unless specified otherwise in the contract. Impregnate all holes using equipment suitable for proper application of the preservative.

Add the following Subsection:

557.04A Untreated Timber. Coat the following untreated timber surfaces in accordance with AWWA M4:

- (a) All ends and tops, and all contact surfaces of posts, sills, and caps.
- (b) All ends, joints, and contact surfaces of bracing and truss members.
- (c) All surfaces of timber bumpers and the back faces of bulkheads.
- (d) All other timber that will be in contact with earth.

557.06 Bolts and Washers.

Add the following to the first paragraph:

Do not galvanize glued laminated deck panel dowels.

Add the following to the second paragraph:

Place cut washers under nuts at steel surfaces. Malleable washers are not required under economy head bolts.

557.09 Framing Bents.

Add the following at the end of the Subsection:

Fasten posts to pedestals with dowels not less than 11/16-inch in diameter that extend at least 6 inches into the posts, or with other types of connectors as specified in the contract. Fasten posts to sills using one of the following methods, as specified in the contract:

- (a) With dowels not less than 11/16-inch in diameter that extend at least 6 inches into posts and sills.
- (b) With drift bolts not less than 11/16-inch diameter driven diagonally through the base of the post and extending at least 7 inches into the sill. Drive drift bolts into holes at a 45° angle to enter the post at least 6 inches above the post base.
- (c) With other types of connectors as specified in the contract.

Treat, furnish, and drive timber piles in accordance with Section 551.

Add the following Subsection after the end of Subsection 557.14, and renumber Subsections 557.15 through 557.21 in the parent Specification to Subsections 557.16 through 557.22:

557.15 Glued Laminated Panel Decks. Do not drag or skid panels. When lifted, support panels in the weak-moment plane at a sufficient number of points to avoid overstressing, and protect the edges from damage.

When dowels are specified in the contract between deck panels, use a template or drilling jig to ensure that dowel holes are accurately spaced and drilled parallel to one another and to the horizontal surfaces of the panel. Drill holes to a depth $\frac{1}{4}$ inch greater than one-half the dowel length, and of a diameter that is $\frac{1}{16}$ inch greater than the dowel, unless otherwise specified in the contract. Use a temporary dowel as a check for snug fit prior to production drilling. Use dowels of the size specified in the contract, with the tips slightly tapered or rounded. Use an approved lubricant to facilitate the connection process.

Start the tips of all dowels partially and equally into the holes of the two panels being joined. Draw the panels together keeping the edges parallel, until the panels abut tightly. Securely fasten each panel to each stringer as specified in the contract.

Assemble and match-mark panels prior to delivery to the construction site when specified in the contract. Follow erection procedures given in FPL-263, Forest Service, Forest Products Laboratory (FPL), Madison, Wisconsin.

571 - PREFABRICATED BRIDGES

Description

571.01 This work consists of designing, fabricating, delivering, and installing prefabricated modular bridge superstructures; or transporting and installing Government-furnished prefabricated, modular superstructures and components; or repairing Government-furnished prefabricated, modular superstructures. The work also includes constructing curbs and railings, caps, bearings, and abutments, including excavation and backfill, anchoring bridge superstructures to abutments as required, riprap, and backwalls.

Materials

571.02 Requirements. Furnish materials that meet the requirements specified in the following sections:

Structural Concrete	552
Prestressed Concrete	553
Reinforcing Steel	554
Steel Structures	555
Bridge Railing	556
Timber Structures	557
Painting	563
Paint	708
Material for Timber Structures	716
Structural Metal	717

Concrete compressive strength; structural steel tensile strength, finish and designation; timber species, grade, and treatment; and other material specifications shall be as required or if not listed in the contract documents, take them from the manufacturer's drawings, and have them approved by the CO prior to fabrication.

Provide a System 3 or galvanized protective coating on steel members according to sections 563 and 708.

Provide pressure treated timber that is Douglas Fir or Western Larch. Except for the wearing surface, treat timber according to Section 716.03.

Provide wearing surface timber that is Douglas Fir, Western Hemlock, Alaska Spruce, Alaska Hemlock, or Alaska Yellow Cedar.

Construction Requirements

571.03 Design Requirements. For required loadings use the most recent AASHTO “Standard Specifications for Highway Bridges” and Figure 1.

When design of the structure is required, submit plans and calculations signed by a professional engineer registered in the state where the bridge will initially be located or in the state where the fabricator’s offices are located.

Consider temporary loads due to handling and erection.

Consider Southeast Alaska’s moist climate and high potential for wood decay and steel deterioration.

Use durable materials to allow removal, transportation, and re-installation using typical forest logging or construction equipment. Use design techniques and fabrication methods to minimize field installation difficulties. Fabricate primary components from steel.

Unless components are furnished by the Government, furnish prefabricated, modular bridge superstructure components complete and in place, including deck, and railing when required, to form a bridge superstructure capable of supporting traffic as soon as construction of approaches is complete. Include all incidental materials required to provide a complete structure ready for use.

Rig main superstructure components with permanent lifting devices to facilitate efficient installation and removal of these items using typical forest logging or construction equipment. Place lifting devices so as not to interfere with traffic.

Design continuous spread or sill type footings between points of superstructure bearing. Provide 5 ft depth of suitable excavated material under the footing and do not exceed 5 kips per square foot of footing-soil contact pressure exerted on the base material, other than solid bedrock. Footing material to be pressure treated wood, glulam, or precast concrete. Native log sills are acceptable if allowed in the contract. Place the front edge of the footing three feet (minimum) back from the top edge of the embankment slope on which it bears. Do not locate the riprap bank protection in this three foot setback. Place footings on a 6 inch layer of crushed aggregate which meets the requirements of the State of Alaska, Standard Specifications for Highway Construction 1998, Table 703-2, grading D1. Extend this leveling course 8 inches (minimum) beyond the edge of the footing.

Design backwalls and wingwalls to retain roadway fill material across the full width of the roadway prism at a slope of 1 vertical to 1.5 horizontal. Extend backwalls to the bottom of the footing. Provide pressure treated wood or precast concrete backwalls. Native log backwalls are acceptable if allowed in the contract.

Provide an untreated timber wearing surface for each longitudinal component. Provide wearing surface planks 3 inches to 4 inches in nominal thickness; 12 inches in nominal width. Extend the wearing surface full length and full width from curb to curb. For bridges installed in a permanent location extend the wearing surface over the top of the backwall. Orient the wearing surface

planks parallel to the longitudinal axis of the roadway and offset the longitudinal joints of the wearing surface over the longitudinal joint of the two main bridge components. Install at least one plank after connection of the two components to cover the center joint. Do not locate plank attachment hardware within or above the top ¼ inch of the wearing surface plank. Provide plank attachment hardware that does not extend below the bottom of the deck planks.

When a curb only system is required, top of curb shall be 15 inches above the top of the wearing surface.

If bridge and approach railing are required, design a bridge railing and approach railing system for 50% of AASHTO rail loading (low volume, single lane bridges). Include in the design proper bridge railing, bridge/approach railing transitions, approach railing, and approach railing terminal sections.

The following modular bridge designs (with curb only) are approved for use in Region 10.

If bridge and approach railing are required, the Contractor is responsible for bridge railing and approach railing design for all bridges.

Hamilton Construction Company

P.O. Box 659 541-746-2426 (voice)

Springfield, OR 541-746-7635 (fax)

www.hamil.com

Bridge lengths of 30, 40, 50, 60, 70, and 80 feet have been approved by Region 10, US Forest Service.

Big "R" Manufacturing and Distributing Company

P.O. Box 1290 1-800-234-0734 (voice)

Greeley, CO 80632 1-970-356-9621 (fax)

www.bigrmfg.com

Bridge lengths of 10, 20, 30, 40, 50, 60, 70, 80, and 90 feet have been approved by Region 10, US Forest Service.

571.04 Design Drawings. When furnishing a prefabricated bridge superstructure, submit design drawings, calculations, or shop drawings at least 21 days in advance of the start of fabrication to allow time for review and correction of any changes and approval by the CO. Include plan, elevation, and section views of the modular bridge superstructure, dimensions of all components, welding and connection details, and general and specific notes regarding design and construction.

When Government-furnished prefabricated bridge superstructure components are specified, material lists, installation information, and manufacturer's instructions will be furnished by the Government.

571.05 General. Perform excavation, backfill, and embankment work according to sections 204 and 209.

Dispose of all debris resulting from operations according to section 203.

571.06 Performance. Notify the CO at least 14 days before delivering the bridge.

If the prefabricated superstructure is not installed immediately upon delivery to the project site, provide appropriate equipment and labor to unload and stack, support, and store all material at the delivery point. Support and stack all components to prevent damage. Furnish and install blocking to support all components at least 12 inches above the ground.

Furnish all tools, devices, special equipment, and material needed for installation in well-marked watertight containers suitable for long-term, outdoor storage.

571.07 Abutments and Approaches. Construct required caps, bearing, abutments, and backwalls according to Division 500. Construct approaches including excavation and backfill according to sections 204 and 209. Construct riprap according to section 251.

Excavate to a depth of 5 feet below the substructure and backfill with suitable excavated material.

571.08 Contractor-Furnished Prefabricated Bridge Superstructure. Furnish the following items for approval prior to delivery of the bridge component:

- (a) Supplier or inspection agency certification of wood species and grade of all timber and a conformance certificate for all sawn and glued laminated members.
- (b) Certification by an approved inspection and testing agency of wood treatment, listing method of treatment, type of preservative, retention, and penetration. Supplier certification is permitted if each piece is stamped or branded with a legible American Wood Preservers Bureau quality mark.
- (c) Certification of structural steel, fasteners, and hardware.
- (d) Certification of galvanizing process used.
- (e) Steel fabricator certification that steel fabrication and quality control meet the requirements of the AISC Code of Standard Practice; and that all welding meets the requirements of ANSI/AASHTO/AWS D 1.5 Bridge Welding Code.
- (f) A complete list of all bridge components, hardware, and fasteners.
- (g) Complete instructions and drawings. Provide drawings that are black line, of reproducible quality, on 11 inch x 17 inch media. Furnish the same information in an approved electronic format.

Mark the end of each major component of the bridge superstructure with the same permanent serial number in a location that is clearly visible, both when stacked in storage and erected at the site.

Assemble bridge superstructure prior to delivery to assure proper fit-up of all components. Notify the CO of the assembly 2 weeks before assembly.

571.09 Government-Furnished Prefabricated Bridge Superstructure. For Government-furnished prefabricated bridge units, transport all material from the storage site(s) to the bridge site, and install the superstructure complete and in place, including connection of all girders, diaphragms, railings, panels, transoms, and other elements. Install the substructure complete and in place including suitable material for fill, crushed aggregate bedding, sills, backwall, and riprap.

Upon taking possession of the Government-furnished units at the storage site, assume liability for damage resulting from handling, transporting, or erecting the units in place, until final acceptance of the project.

571.10 Non-pressure Epoxy Grout Anchors. Furnish non-pressure epoxy grout to cement anchor dowels and bolts. At least 15 days prior to use submit for approval manufacture's test information on the non-pressure epoxy grout proposed for use.

Immediately prior to placing dowels or bolts, clean drill hole of dust and other material. Fill hole halfway with grout. Insert dowels by rotating it though one complete turn while tapping it down. Insert bolts according to manufacture's instructions. If necessary add more grout to fill the hole.

571.11 Acceptance. Furnish a production certification for timber, including glued-laminated lumber, structural steel, and fabricated steel. Furnish a certification for all wood treatment, fasteners, hardware, galvanizing processes, and non-pressure epoxy grout.

Measurement

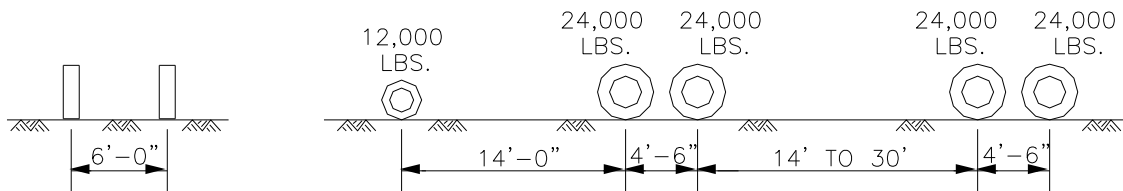
571.12 Measure the Section 571 items listed in the bid schedule according to Subsection 109.02.

Payment

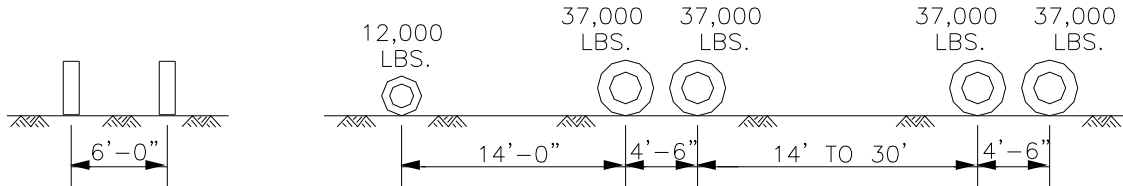
571.13 The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 571 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

ALASKA REGION OFF-HIGHWAY DESIGN VEHICLES AXLE LOADS

*U54 TRUCK – G.V.W. = 54 TONS
HIGHWAY LOG TRUCK
INVENTORY LOAD*



*U80 TRUCK – G.V.W. = 80 TONS
OVERLOADED HIGHWAY LOG TRUCK
OPERATING LOAD*



L90 TRACKED LOADER – G.V.W. = 90 TONS



FIGURE 1

SD-080_NEW
May 2000

572 - LOG STRINGER BRIDGES

Description

572.01 This work consists of building log bridges and log culverts, including abutments, piers, and superstructures and associated excavation and backfill.

Materials

572.02 Conform to the following Sections and Subsections:

Geotextiles	714.01
Timber Structures	557
Wire Rope	709.02
Structural Concrete	552
Reinforcing Steel	554

572.03 Logs. Use designated trees for logs. Use logs used for stringers that are of the correct species and within the dimensional tolerance. Use high quality logs, that are straight, sound, and free of windshake, decay, or excessive twist (spiral grain with a slope of grain relative to the longitudinal axis of the log exceeding 1 in 8). Ensure that knots in the middle half of the stringer length do not significantly affect structural capacity. Obtain approval for all logs to be used in the structure.

572.04 Timber & Lumber. Furnish structural lumber and timber that meets the required species, grades, and dimensions.

572.05 Aggregate. Furnish aggregate for crib abutments, decking, or surfacing.

Construction Requirements

572.06 General. Perform clearing and grubbing according to Section 201. Perform excavation and embankment according to Section 204. Perform structure excavation and backfill according to Section 209.

Handle all logs and timber carefully to prevent damage to the wood.

Dispose of all debris and excess material at approved locations.

Construct abutments and piers as required.

572.07 Performance. Construct bridge superstructures and substructures as required with attention paid to erection, fit-up, and connection. Obtain written approval for all deviations from the plans.

When specified, place timber caps to obtain even and uniform bearing over the tops of supporting posts or piles and with post and pile ends in true alignment. Secure all caps.

Match stringers for size at the bearings and place them in position so that the crown is up. Alternate stringers butt to tip. Locate any knots that may affect the strength of the member in the top portion of the stringer. Lash stringers together with wire rope as required.

Cut stringers to length with a square cut. Cut or hew the bottom surface of the small end of the stringer logs only to the depth necessary to achieve the required bearing area. Block or shim tip ends that are smaller than the largest tip and shim or block as necessary to provide uniform bearing area.

Notch all crib logs together, including face logs, tie logs, and anchor logs and drift pin all connections.

Place geotextile and aggregate to construct a running surface.

Measurement

572.08 Measure the Section 572 items listed in the bid schedule according to Subsection 109.02 and the following:

Measure untreated and treated timber and lumber by the board feet of timber and lumber in place in the completed structure. Compute the quantities from nominal cross section dimensions and actual lengths.

Measure log stringer bridge by the linear foot from center of sill log to center of sill log.

Payment

572.09 The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 572 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

584 - LOG STRUCTURES

584 - Log Structures

Description

584.01 This work consists of furnishing, fabricating, and installing logs and timber, and all associated hardware and other required materials for constructing log culverts, log crib bulkheads, abutments, piers, or berm logs when specified in the contract.

Materials

584.02 Requirements. Furnish materials that conform to specifications in the following section and subsections:

Structural Concrete	552
Reinforcing Steel	554
Timber Structures	557
Log Crib Backfill	704.12
Wire Rope	709.02
Geotextiles	714.01

584.03 Logs. Furnish logs used for culverts, bulkheads, abutments, cribs, piers, or berm logs within the dimensional tolerances and of the species shown on the plans. They must be of high quality, straight, sound, and free of wind shake, decay, or excessive twist (spiral grain with a slope of grain relative to the longitudinal axis of the log exceeding 1 in 8). Ensure that knots in the middle half of the stringer length do not significantly affect structural capacity. If, after cutting, trees are found to be defective notify the CO.

Obtain written approval from the CO for all logs to be used in the structure.

584.04 Timber & Lumber. Furnish structural lumber and timber in accordance with the species, grades, and dimensions shown on the plans and in accordance with Section 557.

584.05 Aggregate. When required, furnish aggregate for decking or surfacing to meet the requirements shown on the plans.

Construction

584.06 General. Perform excavation, foundation, backfill, and embankment work specified in Sections 204 and 209, as applicable.

Handle all logs and timber carefully to prevent damage to the wood and/or preservative treatment.

Dispose of all debris resulting from operations in accordance with Section 203.

Construct log crib abutments, piers, and/or bulkheads as shown on the plans. Anchor tie backs for log crib to the face logs by notching or by lashing.

584.07 Performance. Construct log crib bulkheads, abutments, or piers as shown on the plans, with attention paid to the details of erection, fit-up, and connection. Obtain written approval for all deviations from the CO.

Place timber caps to obtain even and uniform bearing over the tops of supporting posts or piles and with post and pile ends in true alignment. Secure all caps as shown on the plans.

Match stringers for size at the bearings or connection points and place them in position so that the crown is up. Ensure that all logs within a single tier are approximately the same diameter. Alternate tiers of logs butt to tip as necessary to maintain the vertical dimensions shown on the plans. Locate any knots that may affect the strength of the member in the top portion of the member. Cut members to length with a square cut.

Cut or hew the bottom surface of the crib base logs only to the depth necessary to achieve the required bearing area. Block or shim tip ends that are smaller than the largest tip. Cut or dap butt ends to the depth of the largest top end. Allow the maximum slope of any dap to be 1 to 10. Make top and bottom cuts parallel. Require shims or blocks used under small ends to cover the entire bearing area.

Notch log crib bulkhead logs at the connection points specified in the contract, and lash all connections with staples and wire rope of the diameter shown on the plans. Use a minimum of 4 staples per wrap of cable in lashings. Maximum depth of notches shall be as shown on the plans but not to exceed 1/4 the diameter of the log being notched, unless approved otherwise by the CO. Select diameters and notching depths to ensure that the final elevation of the top log of the bulkhead is within +/- 3 inches of the elevation shown on the plans. Orient daps or notches at connections with the dap or notch facing down. Place wood chinking and geotextile for backing behind open spacing between logs so that no material can escape or be washed out. Place material meeting the gradation requirements of Section 704.12 inside and around log bulkheads and abutment structures. Backfill log crib bulkheads in accordance with Section 208 and Subsection 204.11 (a).

Use tiebacks or other abutment anchoring devices as shown on the plans or as approved in writing by the CO.

Lash and install berm logs in accordance with the details shown on the plans. Place backfill around berms to prevent seepage of water through the berm.

Measurement

Method. Measure the Section 584 items listed in bid schedule according to Subsection 109.02 and the following as applicable.

Measure log crib bulkheads, abutments, and piers on a lump sum each basis, including all work necessary to furnish, prepare, and install the log portions of the structures. . Measure structure excavation and backfill for log bulkheads, abutments, and piers in accordance with Section 209. Measure log berms by the lineal foot of installed berms.

602 - CULVERTS AND DRAINS

602.03 General.

Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

Delete the second paragraph and replace with the following.

Join pipe sections together with coupling bands according to AASHTO M 36 or M 196. Limit the use of bell and spigot joints to slopes of 10% or less. Limit the use of bands with projections (dimpled) to slopes of 15% or less.

625 - TURF ESTABLISHMENT

625.03 General.

Delete the entire subsection and add the following:

Apply temporary turf establishment to soil cut & fill slopes within fourteen (14) days after each 2000 foot section of road has been constructed to final grade, unless otherwise agreed by the CO. Cut & Fill slopes damaged by construction activities shall be reseeded within ten (10) days of the damage. See FP section 157.04 (d) for exceptions.

Apply turf establishment to finished slopes and ditches between April 15 and September 15.

Do not seed during windy weather or when the ground is excessively wet, frozen, snow covered, extremely dry, cloddy, hard pan, or is otherwise not friable.

Application Methods for Seed, Fertilizer, & Limestone

"Furnish the kinds of seed and the amounts to be applied in terms of pure live seed as follows:

Seed mixture contains no more than 0.01% of other seed whether identified or not.

<u>Kind of Seed</u>	<u>Live Seed (Lbs/Acre)</u>
1. * Boreal Red Fescue (Festuca Rubra, Boreal variety)	10
2. Annual Ryegrass (Lolium multiflorum)	10
3. * Arctared Fescue (Festuca rubra, Arctared variety)	5
Total	25

* If Boreal Red Fescue or Arctared Fescue is unavailable Fawn Tall fescue may be substituted. If Fawn Tall Fescue is unavailable, then the amounts of the available two may be adjusted to 100%.

Determine the pounds of seed to be furnished per acre by dividing the pounds of pure live seed required per acre by the product of the percent purity and percent germination.

Example $\frac{\text{pure live seed/acre}}{0.90 \times 0.85} = 6.536 \text{ lbs.}$

Commercial seed per acre; purity = 90% and germination = 85%.

Apply seed by the ___dry or hydraulic method___. Fertilizer shall be applied at a rate of 200 pounds plus 103 for urea at pounds per acre in all applications by either the dry or hydraulic method and have a chemical analysis as listed below:

<u>Nutrient</u>	<u>Percent</u>
Nitrogen, N	10
Phosphorus, P ₂ O ₅	20
Potassium, K	10
Nitrogen, Urea	46

Retest Germination after 6 months of Purchase.

Apply mulch when specified at a rate of 1205 pounds per acre by the hydraulic method only.

625.04 Preparing Seedbed.

Delete entire Subsection

625.05 Watering.

Add the following:

During dry soil conditions,

625.11 Measurement.

Delete the second paragraph and add the following:

Seeding and mulching acreage by the acre on ground surface will not be measured for payment. The Contract Quantity for seeding and mulching will be determined by approved designs or averages from design segments included in quantity tables utilized in linear grading pay item.

651 - DEVELOPMENT OF PITS & QUARRIES

Description

651.01 This work consists of clearing, grubbing, stripping topsoil, removing overburden, constructing access roads, conducting restoration activities, and performing other incidental work required for pit or quarry development.

Construction Requirements

651.02 General. Submit a plan of operations according to Section 105. Perform all work in accordance with Sections 105, 201, 203, 204, 205, 625, and 635, landscape preservation requirements, and the approved pit and quarry development plan of operations. Perform the work in accordance with MSHA 30 CFR, part 56.

Confine blasted material and overburden within the designated clearing limits. Unless otherwise approved by CO, retrieve all material which falls outside the designated clearing limits and either incorporate it into the work or stockpile it in designated areas.

Access Roads. Construct or recondition access roads to the pit or quarry as specified in Section 204 and 303, and as SHOWN ON THE DRAWINGS.

651.03 Acceptance. Developing pits and quarries will be evaluated under Subsections 106.02 and 106.04.

Measurement

651.04 Measure the Section 651 items listed in the bid schedule according to Subsection 109.02.

Payment

651.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 651 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

703 - AGGREGATE

Delete 703.05 and replace with the following:

703.05 Subbase, Base, Surface Course, and Screened Aggregate.

(a) Subbase or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	Nonplastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate – Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

(1) Gradation	Table 703-16
(2) Plastic Index, AASHTO T 90	Less than 9
(3) Los Angeles abrasion, AASHTO T 96	55% max.
(4) Free from organic matter and lumps or balls of clay.	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

Table 703-2 Target Value Ranges for Subbase and Base Gradation Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
Sieve Size	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 – 100	100	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
¾ inch			64 – 94 (6)	86 – 100 (6)	100
½ inch	45 – 59 (7)				
⅜ inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	28 – 42 (6)	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	9 – 17 (4)			12 – 26 (4)	12 – 26 (4)
No. 200	4.0 – 8.0 (3)	4.0 – 12.0 (4)	4.0 – 7.0 (3)	4.0 – 7.0 (3)	4.0 – 7.0 (3)

() The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

**Table 703-3
Target Value Ranges for Surface Gradation**

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			100
1/2 inch					71 – 91 (6)	
3/8 inch	56-68 (6)	70 – 80 (6)	80 – 92 (6)	51 – 71 (6)		71 – 90 (6)
No. 4	43-53 (7)	51 – 63 (7)	58 – 70 (7)	36 – 53 (7)	43 – 60 (7)	50 – 68 (7)
No. 8				26 – 40 (6)	30 – 46 (6)	34 – 51 (6)
No. 16	23-32 (6)	28 – 39 (6)	28 – 40 (6)			
No. 40	15-23 (5)	19 – 27 (5)	16 – 26 (5)	14 – 25 (5)	16 – 28 (5)	19 – 30 (5)
No. 200	10.0-16.0 (4)	10.0 – 16.0 (4)	9.0 – 14.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)

() The value in the parentheses is the allowable deviation (\pm) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

Table 703-16

Gradation Requirements for Screened Aggregate

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	M	N	O	P	Q	R
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

703.10(e) Flakiness Index.

Delete and replace with the following:

Flakiness Index, FLH T 508 30% max.

703.10(i) Adherent Coating.

Add the following:

Adherent coating on the aggregate, FLH T 512 0.5% max.

718 - TRAFFIC SIGNING AND MARKING MATERIAL

718.05 Aluminum Panels

Delete the third paragraph and replace with the following:

Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.